Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Title V (draft) No. V-99-019
A.O. Smith Electrical Products Company - Mount Sterling
Mount Sterling. Kentucky
April 28, 2000
STUART ECTON, CHEMICAL ENGINEER/ REVIEWER
Plant I.D. # 103-2680-0009
Application Log # F509

SOURCE DESCRIPTION:

Steel coils are received by the facility. They are decoiled and cut into steel sheets by slitter. These steel sheets are then pressed into the shape of a rotor and steel laminations for the electrical motor. The center of the cut steel is used for the rotor and the outside on the cut steel is used for the stator. The laminations are put into cradles on trays and are conveyored to the heat treating furnaces. The rotor laminations pass through the bluing furnace and the stator laminations pass first through the annealing furnace and then the bluing furnace. The stator laminations that pass through the anneal #3 furnace do not enter a separate bluing furnace because a bluing section is incorporated into the back of this annealing furnace. In order to create a reducing atmosphere and decarbonize the steel, carbon monoxide generators are attached directly to each bluing and annealing furnace. The carbon monoxide generators are separate units, however they only operate when the furnace they are connected to operates. When the entrance to the bluing and annealing furnace opens to allow more laminations into the furnace, a flame curtain is used to maintain the inside atmosphere by not allowing excess air into the furnace.

After passing through their respective furnaces, the laminations are cooled, packed, and then shipped to other A.O. Smith Electrical Products facilities for assembly. The stator laminations that remain at the facility are either bolted or dipped in varnish to hold them together to form the stator core. Then, magnet wire is pushed into the slots of the stator core by an inserter. Next, the magnet wire is laced to the stator core by a nylon cord, and then dipped in a varnish coating to insulate the stator. The varnish coating on the stator core is cured in a bake oven.
After heat treating the rotor laminations, they are sent to other plants where they are stacked together and injected with molten aluminum to form the rotor of the motor. Once the rotors and the stators are made, they are shipped together as a hermetic rotor-stator kit to the customer, who uses these parts for compressors and pumps.

COMMENTS:

The indirect heat exchanger regulations do not apply to the annealing and bluing furnaces because they do not meet the definition in Section 2(2) of Regulation 401 KAR 59:015 or 61:015. Specifically, the medium through which the energy of combustion is transmitted to its point of usage, comes into contact with the products of combustion.

The existing metal parts coating regulations do not apply to the Varnish Dip Process (E.P. 21) Montgomery County is not designated as ozone non-attainment.

Regulation 51:017 does not apply to the CO emissions since these sources were constructed prior to 1970.

Types of control:

None other than the partial conversion of CO to CO_2.

Emission factors:
AP-42 Section 1.4 (Natural Gas Combustion)
Best engineering judgement for CO emissions.

Applicable regulations:

401 KAR 59:010, New process operations.
401 KAR 59:015, New indirect heat exchangers. (Insignificant activities i.e. small boilers)
401 KAR 61:020, Existing process operations.

EMISSION AND OPERATING CAPS DESCRIPTION:

NA

PERIODIC MONITORING:

Since emissions can be easily and accurately estimated using well established emission factors, a semi-annual method 9 reading is deemed sufficient periodic monitoring to ensure compliance for those affected facilities subject to 59:010 or 61:020.

OPERATIONAL FLEXIBILITY:

NA

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or record keeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.